

REMARKS

Claims 1-17 were examined. Claims 1, 5, 10, 13, 15, 16, and 17 are amended. Claims 4 and 12 are cancelled. Claims 1-3, 5-11, 13-17 remain in the Application.

A. 35 U.S.C. §102(b): Rejection of Claims 1, 4, 7, 10, 12, 15, and 17

The Patent Office rejects claims 1, 4, 10, 12, and 17 under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,157,001 of Sakuma (Sakuma).

Independent claim 1 is not anticipated by Sakuma because Sakuma does not describe a plurality of devices formed on a substrate, a scribe line area separating each of the plurality of devices, and a masking material overlying a portion of the scribe line area so that an interface between the masking material and the substrate exists at the substrate surface, the masking material having a thickness across the scribe line area that is equal to and defined by the step height of the plurality of devices, wherein process operations of material removal are completed and the apparatus is in a condition to be singulated. Sakuma teaches an oxide film formed in the surface region of the semiconductor wafer along the center line of the scribing line. However, Sakuma teaches an oxide film formed in such a state that it is partly buried in the surface region of the semiconductor wafer. See column 4, lines 27-31; column 6, lines 52-55.

Independent claim 10 is not anticipated by Sakuma because Sakuma does not describe a plurality of integrated circuits formed on the wafer, each integrated circuit mapped on the surface of a wafer adjacent a scribe line area, and a masking material overlying a portion of the scribe line area so that an interface between the masking material and the substrate exists at the substrate surface, the masking material having a thickness across the scribe line area that is equal to and defined by the step height of the plurality of devices, wherein process operations of material removal are completed and the wafer is in a condition to be singulated. Sakuma teaches an oxide film formed in the surface region of the semiconductor wafer along the center line of the scribing line. However, Sakuma teaches an oxide film formed in such a state that it is partly buried in the surface region of the semiconductor wafer. See column 4, lines 27-31; column 6, lines 52-55.

Claim 4 is cancelled so the rejection is moot. Claim 12 is cancelled so the rejection is moot. Claim 17 depends from claim 10 and therefore contains all the limitations of that claim. For at least the reasons stated with respect to claims 1, 10, and 17 are not anticipated by Sakuma.

The Patent Office rejects claims 1, 7, 10, and 15 under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,157,001 of Ormond et al (Ormond).

Independent claim 1 is not anticipated by Ormond because Ormond does not describe a plurality of devices formed on a substrate, a scribe line area separating each of the plurality of devices, and a masking material overlying a portion of the scribe line area so that an interface between the masking material and the substrate exists at the substrate surface, the masking material having a thickness across the scribe line area that is equal to and defined by the step height of the plurality of devices, wherein process operations of material removal are completed and the apparatus is in a condition to be singulated. Ormond teaches a barrier layer of shock-absorbent material applied into the street. However, Ormond teaches the shock-absorbent layer is deposited in such a manner as to form a concave meniscus. See column 5, lines 20-25; column 6, lines 22-29; Fig. 4.

Independent claim 10 is not anticipated by Ormond because Ormond does not describe a plurality of integrated circuits formed on the wafer, each integrated circuit mapped on the surface of a wafer adjacent a scribe line area, and a masking material overlying a portion of the scribe line area so that an interface between the masking material and the substrate exists at the substrate surface, the masking material having a thickness across the scribe line area that is equal to and defined by the step height of the plurality of devices, wherein process operations of material removal are completed and the wafer is in a condition to be singulated. Ormond teaches a barrier layer of shock-absorbent material applied into the street. However, Ormond teaches the shock-absorbent layer is deposited in such a manner as to form a concave meniscus. See column 5, lines 20-25; column 6, lines 22-29; Fig. 4.

Claim 7 depends from claim 1 and therefore contains all the limitations of that claim. Claim 15 depends from claim 10 and therefore contains all the limitations of that claim. For at least the reasons stated with respect to claims 1, 7, 10, and 15 are not anticipated by Ormond.

Applicant respectfully requests the Patent Office withdraw rejection of claims 1, 7, 10, 15, and 17 under 35 U.S.C. §102(b).

B. 35 U.S.C. §102(e): Rejection of Claims 1, 8, 10, and 16

The Patent Office rejects claims 1, 8, 10, and 16 under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,207,477 of Motooka et al (Motooka).

Independent claim 1 is not anticipated by Motooka because Motooka does not describe a plurality of devices formed on a substrate, a scribe line area separating each of the plurality of devices, and a masking material overlying a portion of the scribe line area so that an interface between the masking material and the substrate exists at the substrate surface, the masking material having a thickness across the scribe line area that is equal to and defined by the step height of the plurality of devices, wherein process operations of material removal are completed and the apparatus is in a condition to be singulated. Motooka teaches an adhesive layer mounted on top of the semiconductor wafer, and a master circuit substrate mounted on the adhesive layer. See column 4, lines 66-67; column 5, lines 1-12.

Independent claim 10 is not anticipated by Motooka because Motooka does not describe a plurality of integrated circuits formed on the wafer, each integrated circuit mapped on the surface of a wafer adjacent a scribe line area, and a masking material overlying a portion of the scribe line area so that an interface between the masking material and the substrate exists at the substrate surface, the masking material having a thickness across the scribe line area that is equal to and defined by the step height of the plurality of devices, wherein process operations of material removal are completed and the wafer is in a condition to be singulated. Motooka teaches an adhesive layer mounted on top of the semiconductor wafer, and a master circuit substrate mounted on the adhesive layer. See column 4, lines 66-67; column 5, lines 1-12.

Claim 8 depends from claim 1 and therefore contains all the limitations of that claim. Claim 16 depends from claim 10 and therefore contains all the limitations of that claim. For at least the reasons stated with respect to claims 1, 8, 10, and 16 are not anticipated by Motooka.

Applicant respectfully requests the Patent Office withdraw rejection of claims 1, 8, 10, and 16 under 35 U.S.C. §102(e).

C. 35 U.S.C. §103(a): Rejection of Claims 1, 2, 3, 5, 6, 9, 10, 11, 13, and 14

The Patent Office rejects claims 2 and 11 under 35 U.S.C. §103(a) as being obvious by combining Sakuma and U.S. Patent 5,714,790 Sakamoto (Sakamoto). Claim 2 depends from claim 1 and therefore contains all the limitations of that claim. Claim 11 depends from claim 10 and therefore contains all the limitations of that claim. For at least the reasons stated above with respect to their independent claims, claims 2 and 11 are prima facie not obvious. For the above stated reasons, Applicant respectfully requests the Patent Office withdraw the rejection to claims 2 and 10 under 35 U.S.C. §103(a).

The Patent Office rejects claims 1, 5, 6, 9, 10, 13, and 14 under 35 U.S.C. §103(a) as being obvious by combining U.S. Patent 5,747,790 Shimomura et al (Shimomura) and Sakuma. Sakuma has been discussed above with respect to independent claims 1 and 10. Claims 5, 6, 9, 13, and 14 depend from claim 1 and claim 10 and therefore contain all the limitations of those claims. For at least the reasons stated above with respect to their independent claims, claims 1, 5, 6, 9, 10, 13, and 14 are prima facie not obvious over the combined references. Further, Applicant believes there is no motivation to combine Sakuma with Shimomura to put a material in a scribe street area before singulating. Shimomura specifically recites removing any material. See Col. 11, lines 44-48. To ignore this specific step in favor of Sakuma requires a reliance on teaching of Applicant's specification. Alternatively, even incorporating the teachings of Sakuma, the combine references still fall short of an apparatus including a masking material overlying a portion of a scribe line area so that an interface exists at the substrate surface, and the masking material has a thickness across the scribe line area that is equal to and defined by the step height of the plurality of devices. For the above stated reasons, Applicant respectfully requests the Patent Office withdraw the rejection to claims 1, 5, 6, 9, 10, 13, and 14 under 35 U.S.C. §103(a).

The Patent Office rejects claim 3 under 35 U.S.C. §103(a) as being obvious by combining Ormond and U.S. Patent 5,300,403 Angelopolus et al (Angelopolus). Claim 3 depends from claim 1 and therefore contains all the limitations of that claim. For at least the reasons stated above with respect to its independent claim, claim 3 is not obvious over the combined references. There is no teaching or motivation from the combined references for a

masking material to have a thickness across the scribe line area that is equal to and defined by a step height of devices. For the above stated reasons, Applicant respectfully requests the Patent office withdraw the rejection to claim 3 under 35 U.S.C. §103(a).



CONCLUSION

In view of the foregoing, it is believed that all claims not pending patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

Respectfully submitted,

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